

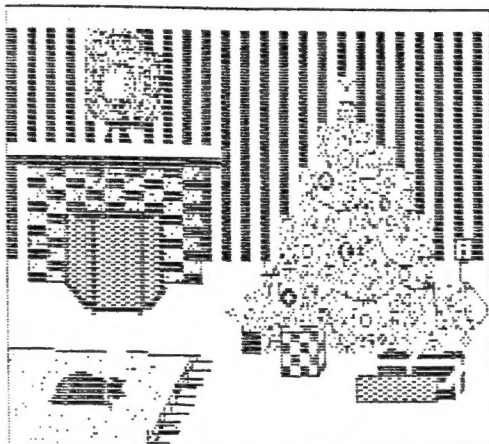
LONG
ISLAND GROUP
Sinclair
TIMEX

L.I.S.T.ING

December January

**SPECIAL
ISSUE**

\$1.50



Holiday Greetings

Tom Green

MEETING DATE CHANGED

Last minute problems have forced us to change the January meeting date to January 6, 1984, still at 9 Dartmoor, Northport - 2:00PM.

LAST MINUTE NEWS

Nazir's Spectrum, Microdrive and Interface I came with 5 tapes (Games & Education), TASWORD II and a utility called "copier." This last, supplied by Sinclair, allows you to transfer programs from tape to microdrive. So far, no "protected" software has caused a problem.

The LAST TWO PAGES of this Special edition, will contain some very special information for our members.

Finally, TOM Bent, of Syncware News tells us that John Oliger is working on a simple hardware modification which may enable some of the Spectrum "unrunnables" to run with our emulators and issue III ROM's. His theory involves Keyboard scanning routines and hardware. To test it out, he needs samples of those "unrunnable" programs. If you have one you can't run on your emulator—send it to John for testing. John's address is 11601 Whidbey Drive, Cumberland, IN 46229,

FLASH! FLASH! FLASH!

MICRODRIVES WORK!

Port Jefferson, N.Y. - Dec. 18, 1984. Nazir P. has successfully interfaced Sinclair Microdrives to his 2068 (with Emulator). He used a homebrew adapter board which simply rerouted the different pins for the various buss lines from his 2068 to their proper ZX Spectrum position (see back issues of LIST).

The only other changes, which may not have been required (experimentation is still going on) were the inclusion of a +12 V. (7812) regulator in place of the Spectrum RAM 12 V. (there is only a 16 V capacitor in the Spectrum Power Supply and the Timex Supply can go as high as 20 V - no load) and a -5 V supply. Both of these may actually only be required for the RS232 port.

Right now, IO REQGE and ROMCS are not hooked up either, but with no apparent problems.

Nazir also tells us that both Zebra and Doug Dewey are working on 2068-to-Spectrum bus adaptors.

LIST - DATA BASE

We'd like to set up special interest groups (e.g., at least 20% of our members are TS1000 only owners) and find out more about our group resources.

Here's our member questionnaire again. Even if you filled one out the first time (July), your situation has probably changed. Please take the time to fill out the questionnaire and return it to LIST, Box 438, Centerport, N.Y. 11721-0438.

We'll also need a volunteer to enter the data into PRO/FILE.

LIST GROUP

P.O. BOX 438
CENTERPORT, N.Y. 11721-0438

L.I.S.T.ING

MEETING NOTES - DECEMBER 3, 1984

I. NEXT MEETING(S)

- a) Sunday Jan. 6th at 9 Dartmoor - 2:00PM
- b) Sunday Feb. 3rd - South Shore - 2:00PM?
(Basic for Beginners Class - 1:00PM??)

Theme of the meeting - Word processors and 64 column mode. Bring your WP software for a demo. Zebra Systems will be demoing some Graphics tablet software for technical drawing.

- II. The meeting was called to order at 2:15PM. New members Izzy G. and Cem B. swelled our ranks of active members to 40. A small, year end "dividend" still looks likely. Infoworld magazine published a short blurb about us in their Dec. 10th issue. We are receiving some 10 pieces of mail, requesting information, each day. A plea was made for a corresponding secretary to help handle this workload. A volunteer will step forward at the next meeting.

Bob M. has begun to enter the member data base info. The first version, using PRO/FILE, is ready.

It was further suggested that a software list be generated. This would allow a member to talk to someone who already owns software he is thinking about buying, before he jumps in head first. Bob wasn't at the meeting, but will be asked to coordinate this activity.

Alternate meeting dates, times and places (e.g., schools, libraries) were discussed, with the consensus being that the present method was still adequate for our needs.

Suggestions for community service activities (above and beyond our provision of free information and newsletters to all who apply) were solicited. BASIC for Beginner classes were discussed.

Members will bring their suggestions for software to be purchased for a true "members only" software library, next meeting. No rental fee would be charged to members. A small handling fee would be required (e.g., for insurance, mailers etc.) and a non-copyright infringement agreement must be signed. (Do we have an attorney out there who would write one up for us?) The purpose of the library will be to let you try before you buy. A volunteer for full time "librarian" is absolutely essential for this plan to work. If none is found, next meeting, the idea will be scrapped.

III. NEW NOTES AND ANNOUNCEMENTS

- a) Nazir had the following:

- 1) Abersoft FORTH works with Spectrum ROM
- 2) PASCAL (Hi-Soft) works
- 3) 'C' Computer (') - bombs out
- 4) Floating Point Compiler Loads But won't run
- 5) & Hi-Soft Toolkit " " " "
- 6) Betasoft BASIC - works very well
- 7) Hot Z is available on Cartridge, Using an Oliger Board-\$20.00 and ROM's from Hot Z (Ray K). This system comes up in the dock bank and therefore uses virtually no RAM in your 2068.

- b) Bob Gilder demoed a Spectrum he had just bought in Europe. He ran it on a B & W set by adjusting the H & V frequency controls. Color is another matter though. Bob also showed us an issue of "Spectrum Computing" a tape magazine. It was good, but Bob feels it is not up to the standard set by 16/48 magazine.
- c) Jeff S. and Stewart N. demoed Zebra's "Coloring Book" software for the graphics tablet. A dozen or so line drawings are provided on each \$10 tape. The (young) user uses the tablet to fill in the different picture areas.

Zebra will be featured in an upcoming segment of "High-Tech Times" on PBS. Check your local channel for show #210. It will be on in our area in late December and on WNET (13) in March or April '85.

A 4 page addendum to Smart Term II software has been published, Stewart will bring samples to the next meeting. Zebra's BBS will continue to be down 9-5 weekdays until the First of the year. TS 1000 software for the Westridge MODEM is due out soon.

- d) Heniz H. (2068) and Paul D. (TS 1000) have sent messages and pseudo REM statements between their Byte Back MO DEMS. An attempt to do so again, at the meeting, failed, probably due to the lack of a real current loop.
- e) Hewlett called LICA's BBS and we used his EP-44 to get hard copy. What was particularly interesting, was that the 2068's and EP-44's buffers worked in tandem.
- f) Paul D. showed his Kempston joystick interface (see article) for the "Spectrum".
- g) Library tapes were distributed to each Loop. Remember to keep the tape no more than 1 week if possible, to add a program of your own, and to send them off to the next "loopmate". Tape #2 is already in the works.

IV. LICA NOTES

LICA meets 3rd Friday of each month at 8:00PM - at NYIT - Old Westbury Campus

Meeting dates and Subjects:

Jan 18	AT&T, BULLETIN BOARDS
Feb 15	PENCEPT
Mar 15	BETTER BASIC, NEWSDAY (CNN)
Apr 19	COMPUSERVE

If you are a LICA member, as well as a LIST member, please let us know.

SPECIAL NOTES:

- 1. This Special Holiday issue will cover both Dec. and Jan. We think you'll agree that both size and quality of articles make this the equivalent of 2 regular issues.

2. Election of Officers

Some normal membership year is Feb. to Jan., we should elect new officers and committee chairmen no later than the Feb. meeting. Please be prepared to make nominations. Positions which must be filled are:

President
Sec'y - Treas.
Corresponding Sec'y
Newsletter Editor
Librarian
Membership coordinator (Data-Base)

12/84

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a not-for-profit users group

Your reviews, programs, comments, hardware projects, etc., are eagerly
solicited for publication in LISTing.

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or the original author.

Please note our new address - P.O. BOX 438, Centerport, N.Y. 11721-0438
Mail sent to the old address must be forwarded there and will take
longer to reach us.

NOTE: PARTIAL YEAR MEMBERSHIPS AVAILABLE

Normal membership year is Feb. through Jan. at cost of \$12.00.
By keeping as many members as possible on that basis, we keep
our costs and chances of error, down.

If you wish to begin subscribing later in the year, please sign
up for the end of this year and all of next. E.g., to subscribe
in Nov. 84, we ask that you remit \$18.00, which will cover you
through Jan'86, rather than send 4.00 now and 18.00 in Jan.
(the rates may go up then also)

We will accept partial years or different subscription runs,
on a limited basis (particularly from members outside the U.S.).
But, please be aware that, in addition to possible rate increases,
your "account" must be handled "by hand" and errors may occur.
More on international members next issue.

PRINTING:

We have received a number of complaints about size and legibility
of the newsletter. Every effort is being made to correct these
problems. We hope the size of print in this issue is more
acceptable.

SPECIAL THANK YOU:

To Chuck Russell, he produced last months newsletter,
and the library tapes. Great work Chuck!

VENDOR REPORT - CATALOGS RECEIVED

Syntax Software
PO Box 486
West Kennebunk, Ma 04094

JMJ Distributors
Box 208
Hewlett, N.Y. 11557
(516) 825-2650

Compucon
62 Fulton Avenue
Smithtown, N.Y. 11787
(516) 724-5975

National Software Library
200 Mulgrave Road
Cheam, Surrey SM2 6JT UK

Software Supermarket
87 Howard's Lane
London, England SW15 6NU

Zebra Systems
78-06 Jamaica Avenue
Woodhaven, N.Y. 11421
(718) 296-2385

Aerco
Box 18093
Austin, Texas 78760
(512) 451-5874

Sharp's
127 Nine Mile Road
Sandston, Va. 23150
(804) 737-4895

Kaltek
Box 971, Adjuntas
Puerto Rico, 00601

Kompak, Inc.
1525 Aviation Blvd
Suite A-111
Redondo Beach, Ca 90278

Ramex
48945 Van Dyke Road
Utica, MI 48087
(313) 463 1795

Some Timex Software
They don't say what

A buying service
May provide discounts
on peripherals

Good Prices on Diskettes

(Bulk = 100/box)

Tape rentals & good prices (discount)
on Purchases-and good service.

Most "Hit" software titles
Prices are high (LIST)
Service is good. Takes VISA

New Graphics Tablet - 2068
sells most 2068/TS1000 software
and Peripherals

Centronics interface - \$99 for TS1000
also Disc Drives

Strategy Games
Disassembler etc.
Takes Visa
Compuser 75136.1775 - MC1 233 9544

Simple hardware interfaces
Most less than \$25 for the TS1000.

Eprom "Cartridge" Boards
for TS1000

Most 2068 Software including TAS word
Pro/file and more List price - takes Visa

Softsync
14 East 34th Street
NY City 100016
(212) 685-2080

Sunset Electronics
2254 Taraua Street
San Francisco, Ca. 94116
(415) 665-8330

Games to Learn By, Inc.
PO Box 78
28 Claire Hill Road
Collinsville Ct. 06022
(203) 673 7089

Heath Computer Services
950 East 52nd South
Greentown, In. 46936
(317) 628 3130

E. Arthur Brown
3405 Pawnee Drive
Alexandria, Mn 56308
(612) 762 8847

Wilco Services
PO Box 5696
Vandenberg, Ca 93437-5696

WMJ Data Systems
4 Butterfly Drive
Hauppauge, N.Y. 11788

Pleasantrees
PO Bos 2034
Mesa, Az 85204

Barry Carter
Box 614
Warren, Mi 48090

Best Bussiness & Tax Service
Box 1586
Vista, CA 92083
619-727-4012

HD Software
1445 Oldfield Road.
Decatur, GA 30030

2068 Games & Zeus assembler

Takes Visa/M/C

Most all hardware/software, books
for 2068 and 1000
List price or below. Some Spectrum Software.

Carry most other vendors lines of TS1000
and 2068 materials

Person & Business Programs

TS1000 & 2068 - Takes Visa

Most hardware & software. List Price,
Takes Visa

Rampacks - \$11
M.W. Printer - \$30
TS 1000 SW - 50 Min Order \$50.

New TS Pullication?
Quarters
Sells TS1000 & TS 2068 Software

Graphics "ATOZ"
XON?
New 2068 Software due soon

30 page manual
to help you use M-Term - \$5.00

1984 Tax Program
100/2068 \$29.95

Coupon Manager
\$24.95 for TS 2068 version

VENDOR REPORT

LIST GROUP

JOY TO THE WORLD!

HARDWARE REVIEW

ITEM: KEMPSTON JOYSTICK INTERFACE
FOR: SPECTRUM (TS2068 & TS1000 Too!)
FROM: KEMPSTON MICRO ELECTRONICS LTD.
SINCE WAY
WOBURN ROAD INDUS. ESTATE
KEMPSTON, BEDFORD MK427AF-UK
PRICE: £11.50 (incl. VAT)

By now, if you've converted your TS 2068 to a Spectrum, you've found out that your built-in joystick ports cannot be used with Spectrum Software.* While many strategy and adventure games and utilities benefit little from the use of a joystick, there are arcade games (ATIC ATAC comes to mind) which are virtually impossible to play without one. The ZX Spectrum didn't originally come with a joystick port, so the enterprising British firm of Kempston Inc., invented one. The Kempston joystick caught on so well in the U.K. that most new software is compatible with their interface. The question, of course, is whether or not this interface will work with a TS 2068 which has been "Spectrumized".** The answer is a resounding "YES!"

The Kempston unit is a small, simply designed single-sided circuit board mounted in a black plastic case. The assembled unit measures about 2" X 1" X 3 1/2" wide and fits on the expansion buss of your 2068, albeit snugly. If you're worried about stressing your 2068 PC board, I'd remove it from its case (4 screws). Mounted on the PC board are two simple logic chips, one selects input port 31, the other "exposes" the 2068's data lines to the contacts in your joystick. When you close one of those, a data line is taken high.

Any Atari compatible joystick, with 9 pin 'D' plug, can be plugged into the port on the Kempston joystick. That port's mounting however, leads to what is perhaps the most prevalent criticism of the Kempston system. The port is on the front of the unit and this means your joystick's cord must trail across your keyboard for use. On complicated games, (like flight simulator) where you must use many other keys for control functions, status reports, etc., that trailing cord can be a bother.

The board is dead ended. That is, it has a 2 X 23 way female socket for the back of your computer, but no male edge connector for more add-ons. As long as the joystick is your last peripheral and the front mounted connector doesn't interfere with the peripheral in front of it, you're OK. The Timex printer interface works fine, others might not.

Last criticism is one I've voiced before. That is, the lack of decoding and decoding documentation. The Kempston ads don't tell you how the joystick is mapped, and they should. There is a small flyer which comes with the unit, and gives some good examples of how to use the stick in your program and/or patch commercial software. (The commercial program must first be "broken" and then disassembled, however, which is no mean feat). IN 31 is the command, we're told, which will activate the unit. If a 0 is returned, then nothing has happened. The four directions and fire return 1,2,4,8 and 16 to the IN 31 command. A look at the actual circuit shows that, in addition to IORQ and RD, only address line A5 is used to activate the interface. This means the unit responds to any I/O port in the range:

255 to 64 & 31 to 0
That is, it only doesn't see ports in the range 32 to 63. If you try to use this interface with other I/O mapped devices, keep this in mind.

Despite these drawbacks, the arcade game players in our household are absolutely thrilled with the unit. I'll rate the Kempston interface a 9 out of 10. A higher score would have been given for more complete decoding, as the unit works well and is quite good value for the money. (Mine cost £14 including Air postage. Kempston do take VISA, as well.

*The singular exception here may be Penetrator ** See back issue of LISTING for ways to do this.

HEADER WRITER

Here's a crude, but effective, technique for writing your own tape headers. When coupled with a header reader program (Nazir's, Syntax's etc.), you can create "phoney" program headers with which you can fool your system into letting you see what is really going on, or Load that "unmergeable" program.

What we need to do, particularly in the case of some autostart and ØREM programs, is replace the autostart portion of the header with a code that doesn't say "auto-start". We could write a machine code program to generate our ersatz header, but there is a simpler, and certainly quicker, way, particularly if we're dealing with a "loader".

In order to load screens and code, we must first load a BASIC program called "LOADER". The job of this program is to set up the system the way we want it (e.g., make it unmergeable) and then load the machine code and/or other BASIC blocks of our software. Most "Loaders" are only long enough to do just that i.e., 100 to 200 bytes. All we need to do is make our own "dummy" program (e.g., 1 REM XXX...(100 or 50 X's) XXX, and save it's header to tape. Our dummy header will not have autostart, so the loaded program will be frozen before it can do any dirty work.

We must first, of course, find out how long the original loader was. We can use the header reader to do this and follow the instructions below:

- 1) Read original Header-using header reader, and STOP the tape, immediately-and take it out of the player.
- 2) Create Basic Program of same length as header says, but with NO AUTOSTART (use reader to check length - trial and error) Most Basic Loaders are short - typically 0 or 1 REM and 200 bytes or less. Your "Dummy" program can be just 1 REM XXX...XY, just so long as it is the same length as the original.
- 3) Save New Dummy program (Header is all you really need) on a blank tape. Do a normal; SAVE "TEST".
- 4) NEW the machine
- 5) Now LOAD"" just the header of the dummy program.
- 6) Stop the tape as soon as the dummy header has loaded.
- 7) Switch tapes - the original program should still be set just after the BASIC header, but before the actual code loads.
- 8) The computer is still waiting for the program, so play the original tape.
- 9) The program should now load, but not autostart, and you can examine and/or change it to your hearts content.

Alternate: make up a header that says the program is CODE. Then peek the values of the "CODE". They could even be poked (e.g., the 0 in Ø Rem, changed to a 1) and then resaved with a dummy BASIC header.

* We assume most readers know that when you load a tape there is a 5 second tone, followed by a short (17 bytes) burst of code, called a header, which tells the 2068 what is coming next. There is then a brief period of silence followed by a 2 second tone and the program data.

LIST GROUP

RECONCILE

Here's Richard Cunningham's Bank Reconciler program. Use it to balance your checkbook and avoid those low balance fees. Instructions are in the program.

```

1 REM Program "bankrec"
2 CLS : BORDER 6: INK 9
3 LET b=0: LET c=0: LET d=0
4 LET e=-1: LET i$=""
5 POKE 23658,8
6 POKE 23659,100
7 PRINT PAPER 6: "BANK RE
CONCILIATION
15 PRINT AT 1,1: INK 7: "turn o
n Printer for hard copy: "AT 1,0
OVER 1: PAPER 4: "
20 INPUT FLASH 1: BRIGHT 1: "
ENTER TODAY'S DATE
25 GO SUB 2000
26 BORDER 2
28 CLS : BEEP .2,18: PRINT AT
0,0: "CHECKBOOK RECONCILIATIO
N "AT 0,0: OVER 1: PAPER 4:
INK 7: "
29 PRINT INVERSE 1: " REVIEW O
F CHECKBOOK ENTRIES
30 PRINT AT 3,0: "Ent# Pay/Deb
: TAB 14: "Deposit: TAB 25: "BALA
NCE: AT 3,0: OVER 1: PAPER 5: "
32 PRINT AT 2,3: PAPER 6: "DATE
: AT 2,15: es: AT 2,0: OVER 1: "
35 LPRINT AT 0,0: "CHECKBOO
K RECONCILIATION "AT 0,0: OV
ER 1: PAPER 4: "
36 LPRINT INVERSE 1: " REVIEW
OF CHECKBOOK ENTRIES
37 LPRINT AT 1,15-LEN es/2-3, "
Date: "es: AT 1,0: OVER 1: "
38 LPRINT AT 2,0: "Ent# Pay/Deb
: TAB 14: "Deposit: TAB 25: "BALA
NCE: AT 2,0: OVER 1: PAPER 5: "
40 INPUT "ENTER STARTING DTE/C
K# BEGINNING ENTRIES: "ss: PR
INT AT 4,0: PAPER 4: "BEGIN ENTRIE
S (Dte/cK#) "ss:
41 LPRINT AT 4,0: PAPER 4: "BEG
IN ENTRIES (Dte/cK#) "ss:
43 INPUT "1-ENTER BALANCE: "b
44 LET b=INT (b+100+.5)
45 GO SUB 400
46 GO TO 120
50 INPUT INK 9: PAPER 7: "NEXT
ENTRY: "PAPER 2: "OK? "PAPER 7
OR "PAPER 1: "DEPOSIT? "P
APER 7: " (ENTER C OR d) "mm"
FOR MENU: i$
70 IF i$="c" THEN INPUT INK 9:
"Enter Amount of: "PAPER 2: "che
ck: "c
80 IF i$="d" THEN INPUT INK 9:
"Enter Amount of: "PAPER 1: "DEP
OSIT: "d
85 IF i$="m" THEN CLS : GO TO
2000
90 IF i$<>"m" AND i$<>"c" AND
i$<>"d" THEN GO TO 50
110 PRINT TAB 1,6: "s"
120 IF i$="c" THEN GO SUB 200:
PRINT TAB 12-LEN cs:cs:
122 IF i$="d" THEN GO SUB 300:
PRINT TAB 13: "s": TAB 22-LEN ds:d
s:
123 GO SUB 400: PRINT TAB 23: "s
": IF b=0 THEN PRINT TAB 32-LE
N bs:bs:
125 IF b<0 THEN PRINT TAB 31-LE
N bs: INK 7: PAPER 2: "b$
130 IF i$="c" THEN LPRINT TAB 1
: "s": TAB 10-LEN cs:cs:
131 IF i$="d" THEN LPRINT TAB 1
: "s": TAB 20-LEN ds:ds:
132 LPRINT TAB 31-LEN bs: "s"+bs
140 LET c=0: LET d=0: LET i$=""
150 GO TO 50
200 LET c=INT (c+100+.5)
210 LET cs=STR$ c
220 IF c=0 THEN LET cs="000"
230 LET cs=cs+1 TO LEN cs-2)+ "
+cs(LEN cs-1 TO )
240 IF VAL cs=0 THEN GO TO 252
250 LET cs=cs(2 TO )
252 LET b=b-c
255 RETURN
300 LET d=INT (d+100+.5)
310 LET ds=STR$ d
320 IF d=0 THEN LET ds="000"
330 LET ds=ds(1 TO LEN ds-2)+ "
+ds(LEN ds-1 TO )
340 IF VAL ds=0 THEN GO TO 352
350 LET ds=ds(2 TO )
352 LET b=b+d
355 RETURN
400 LET e=e+1
410 LET bs=STR$ b
420 IF b=0 THEN LET bs="000"
430 LET bs=bs(1 TO LEN bs-2)+ "
+bs(LEN bs-1 TO )
440 IF VAL bs=0 THEN GO TO 500
450 LET bs=bs(2 TO )
500 RETURN

```

```

2000 BORDER 6
2002 POKE 23658,0
2005 PRINT TAB 15-LEN es/2: PAPE
R 4: INK 7: es
2010 PRINT : PRINT TAB 9: PAPER
3: "INSTRUCTIONS"
2020 PRINT : PRINT TAB 1: "1- To
verify checkbook entries."
2030 PRINT : PRINT TAB 1: "2- To
Reconcile Bank statement" w
ith your checkbook."
2050 PRINT AT 2,0: FLASH 1: BRI
GHT 1: PAPER 2: "PRESS APPROP
RIATE NUMBER
2050 IF INKEY$="1" AND INKEY$<>
"2" THEN GO TO 2050
2070 IF INKEY$="1" THEN GO TO 26
3000 CLS : BORDER 2
3002 LET i$=""
3005 LET b=0: LET c=0: LET d=0
3010 PRINT PAPER 3: "STATEMENT
RECONCILIATION "
3015 LPRINT : LPRINT : LPRINT "
STATEMENT RECONCILIATION "
3020 PRINT AT 13,0: "ENTER CHECKS
OUTSTANDING: C# IN "CHECKBOO
K BUT NOT ON STATEMENT"
3023 LPRINT INVERSE 1: " CH
ECKS OUTSTANDING
3024 PRINT AT 2,0: INVERSE 1: "
CHECKS OUTSTANDING
3025 PRINT AT 1,3: PAPER 6: "DATE
: AT 1,15: es: AT 1,0: OVER 1: "
3026 LPRINT AT 1,15-LEN es/2-3: "
Date: "es: AT 1,0: OVER 1: "
3027 PRINT AT 3,0: "CHECK #/DATE
AMOUNT TOTAL "AT 3,0: OV
ER 1: "
3028 LPRINT "CHECK #/DATE AMOUNT
TOTAL "AT 4,0: OVER 1: "
3030 INPUT "ENTER CHECK DATE OR
NUMBER: "PAPER 2: "enter "f" w
hen finished "i$
3035 IF i$="f" THEN GO TO 4000
3040 PRINT i$
3041 LPRINT i$
3050 INPUT "ENTER AMOUNT OF CHEC
K: "c
3052 LET c=c+c
3055 GO SUB 200: PRINT TAB 12: "s
": TAB 21-LEN cs:cs:
3056 LPRINT TAB 12: "s": TAB 21-LE
N cs:cs:
3060 GO SUB 400: PRINT TAB 23: "s
": TAB 32-LEN bs:bs:
3061 LPRINT TAB 23: "s": TAB 32-LE
N bs:bs:
3090 GO TO 3030
4000 CLS : BORDER 1: PRINT PAPER
3: "STATEMENT RECONCILIATION
4001 LPRINT : LPRINT : LPRINT PA
PER 3: "STATEMENT RECONCILLAT
ION
4002 LET b=0: LET d=0: LET c=0
4003 LET i$=""
4005 PRINT AT 19,0: "ENTER DEPOSI
TS OUTSTANDING: DEP: "IN CHECKBO
OK: NOT ON STATEMENT"
4010 LPRINT INVERSE 1: " DEP
OSITS OUTSTANDING
4011 PRINT AT 1,0: INVERSE 1: "
DEPOSITS OUTSTANDING
4017 PRINT AT 2,3: PAPER 6: "DATE
: AT 2,15: es: AT 2,0: OVER 1: "
4018 LPRINT AT 1,15-LEN es/2-3: "
Date: "es: AT 1,0: OVER 1: "
4030 PRINT AT 3,0: "DEPOSIT# /DATE
AMOUNT TOTAL "AT 3,0: OVE
R 1: "
4040 LPRINT "DEPOSIT# /DATE AMO
UNT TOTAL "AT 4,0: OVER 1: "
4045 INPUT "ENTER DEPOSIT DATE O
R NUMBER: "PAPER 2: "enter "f" w
hen finished "i$
4048 IF i$="f" THEN GO TO 5000
4050 PRINT i$
4055 LPRINT i$
4058 INPUT "ENTER AMOUNT OF DEPO
SIT: "d
4059 LET d=d+d
4060 GO SUB 300: PRINT TAB 12: "s
": TAB 21-LEN ds:ds:
4061 LPRINT TAB 12: "s": TAB 21-LE
N ds:ds:
4065 GO SUB 400: PRINT TAB 23: "s
": TAB 32-LEN bs:bs:
4070 LPRINT TAB 23: "s": TAB 32-LE
N bs:bs:
4080 GO TO 4045
5000 CLS : BORDER 6: PRINT PAPER
6: "FINAL RECONCILIATION

```

```

5001 LPRINT : LPRINT : LPRINT :
INVERSE 1: "FINAL RECONCILLI
ATION
5005 INPUT "ENTER FINAL BALANCE
ON BANK STATEMENT: "b
5008 LET b=INT (b+100+.5): GO SU
B 400
5010 PRINT "STATEMENT BALANCE: "
5011 IF b<0 THEN PRINT TAB 23: P
APER 2: BRIGHT 1: "s": TAB 25: "s":
TAB 32-LEN bs:bs:
5012 IF b=0 THEN PRINT TAB 23: "
s": TAB 32-LEN bs:bs:
5015 LPRINT "STATEMENT BALANCE: "
5017 IF b<0 THEN LPRINT TAB 23:
INVERSE 1: "s": TAB 25: "s": TAB 32-
LEN bs:bs:
5018 IF b=0 THEN LPRINT TAB 23:
"s": TAB 32-LEN bs:bs:
5019 LET d=INT (d+100+.5): GO S
UB 310
5020 PRINT : PRINT "ADDITIONAL D
EPOSITS: "FROM CHECKBOOK: TAB 2
3: "s": TAB 32-LEN ds:ds:
5021 LPRINT : LPRINT "ADDITIONAL
DEPOSITS: "FROM CHECKBOOK: TAB
23: "s": TAB 32-LEN ds:ds:
5035 PRINT "
5036 LPRINT "
5038 GO SUB 410
5040 PRINT "TOTAL: "
5041 IF b<0 THEN PRINT TAB 23: B
RIGHT 1: PAPER 2: "s": TAB 25: "s":
TAB 32-LEN bs:bs:
5042 IF b=0 THEN PRINT TAB 23: "
s": TAB 32-LEN bs:bs:
5043 LPRINT "TOTAL: "
5044 IF b<0 THEN LPRINT INVERSE
1: TAB 23: "s": TAB 25: "s": TAB 32-L
EN bs:bs:
5045 IF b=0 THEN LPRINT TAB 23:
"s": TAB 32-LEN bs:bs:
5048 PRINT "
5049 LPRINT "
5050 LET c=INT (TC+100+.5)
5055 GO SUB 210
5060 PRINT : PRINT "LESS CHECKS
OUTSTANDING: TAB 23: "s": TAB 32-L
EN cs:cs:
5061 LPRINT : LPRINT "LESS OUTST
ANDING CHECKS: TAB 23: "s": TAB 3
2-LEN cs:cs:
5065 GO SUB 400
5070 PRINT "
5071 LPRINT "
5080 PRINT : PRINT PAPER 5: "FINA
L BALANCE: "IF b<0 THEN PRINT
TAB 20: BRIGHT 1: PAPER 2: "00 $
": TAB 25: "s": TAB 32-LEN bs:bs:
5081 IF b=0 THEN PRINT TAB 23: "
s": TAB 32-LEN bs:bs:
5085 LPRINT : LPRINT "FINAL BALA
NCE: "IF b<0 THEN LPRINT TAB 2
0: INVERSE 1: "00 $": TAB 25: "s": T
AB 32-LEN bs:bs:
5086 IF b=0 THEN LPRINT TAB 23:
"s": TAB 32-LEN bs:bs:
5090 PRINT "
5091 LPRINT "
5100 INPUT "NOW ENTER CHECKBOOK
BALANCE: "CB
5110 LET CB=CB+100
5112 LET BS=STR$ CB: GO SUB 420
5114 PRINT "CHECKBOOK BALANCE: "TAB
32-LEN bs:bs:
5115 LPRINT "CHECKBOOK BALANCE: "TA
B 32-LEN bs:bs:
5117 IF B=CB THEN PRINT TAB 3:
PAPER 5: "O.K. CORRECT BALANCE.
": TAB 32-LEN bs:bs: PAPER 7: bs:
5118 IF B=CB THEN LPRINT TAB 3:
INVERSE 1: "O.K. CORRECT BALANCE.
": TAB 32-LEN bs:bs:
5120 IF B=CB THEN GO TO 5200
5123 LET BS=STR$ (B-CB): GO SUB
420
5124 IF B=CB THEN PRINT PAPER 1:
"CHECKBOOK BAL. IS UNDER: "TAB 32-L
EN bs:bs: PAPER 7: bs:
5125 IF B=CB THEN LPRINT INVERSE
1: "CHECKBOOK BAL. IS UNDER: "TAB 3
2-LEN bs:bs:
5130 IF B=CB THEN PRINT PAPER 2:
"CHECKBOOK BAL. IS OVER: "TAB 32-LE
N bs:bs: PAPER 7: bs:
5131 IF B=CB THEN LPRINT INVERSE
1: "CHECKBOOK BAL. IS OVER: "TAB 3
2-LEN bs:bs:
5190 PRINT AT 20,0: PAPER 5: "Ab
ove balance should equal bal- and
e in your checkbook."
5200 PRINT AT 20,0: PAPER 5: "Bal
ance should equal Ckbook Bal."
5210 PRINT PAPER 4: "PRESS ANY
KEY TO START AGAIN "
5220 PAUSE 0: CLS : BEEP .2,25:
GO TO 2000

```

This is a sample output from Richard C's "BANKREC"

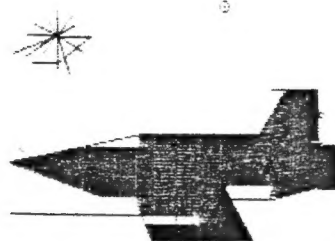
CHECKBOOK RECONCILIATION
 REVIEW OF CHECKBOOK ENTRIES
 Date: NOV 5 84
 Entry Pay/Dep Deposit BALANCE
 BEGIN ENTRIES (Dte/ck#) 0 \$0.00

STATEMENT RECONCILIATION
 CHECKS OUTSTANDING
 Date: NOV 5 84
 CHECK #/date AMOUNT TOTAL

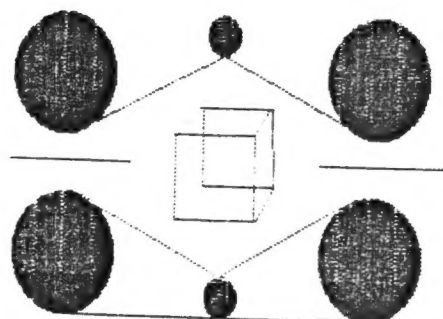
STATEMENT RECONCILIATION
 DEPOSITS OUTSTANDING
 Date: NOV 5 84
 DEPOSIT#/DATE AMOUNT TOTAL

FINAL RECONCILIATION
 STATEMENT BALANCE: \$ 0.00
 ADDITIONAL DEPOSITS
 FROM CHECKBOOK: \$ 0.00
 TOTAL: \$ 0.00
 LESS OUTSTANDING CHECKS:
 \$ 0.00
 FINAL BALANCE: \$ 0.00
 CKBOOK BALANCE: 0.00
 BALANCE: \$ 0.00

graphics



Print & Plotter Paintbox did these



SCREEN DUMPS

Enter the world of "Micro-print"

Enter the world of "Micro-print"

Enter the world of "Micro-print"

Enter the world of "Micro-print"

Enter the world of "Micro-print"

Enter the world of "Micro-print"
 "Micro-print 85" Copyright Mirmidon Software 1984.

Micro-print ... so what is it?

"Micro-print 85" is an extra and separate printing routine for SPECTRUM's which releases you from the strict 32-pitch character format of Sinclair PRINT statements by offering you a constant choice of 32, 36, 42, 51, 64 and 85 characters/line pitch scripts in all the programs into which you add it.

The software you write can now display a great deal more text or numbers in the same screen space, with 5 new ultra-clear type-faces. This page is in "51", with a "42" heading: in "64" it looks like this ...

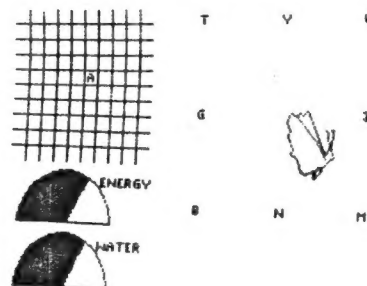
The programs you write can now display a great deal more text or numbers in the same screen space than they were able to before. This part is now in "64", and in "85" it's even more compact ...

The programs you write can now display a great deal more text or numbers in the same screen space than they were able to before. This part is now in "85" characters/line script, which is about as far as even there-print can go!



SPACE moves to next animal
 ENTER chooses this animal

Survival (Sinclair)



L_I_S_T GROUP

12/84 - 8

Technical Report:

To open (and close) Sinclair ZX-81 and Timex 1000 Computers

A note of caution: If terms are unfamiliar or confusing, the likelihood is very high that the reader should not attempt to even open the computer. You will probably damage something. The following comments are aimed at technical types who can assemble Heathkits and own items such as soldering irons, miniature phillips screwdrivers and are conversant with dikes, duckbill pliers and 3 terminal regulators.

1. To open computer, turn it on it's back and remove the three (3) rubber feet at upper left, bottom left and right. Then, using a #0 phillips screwdriver, remove the five (5) screws. Lift off the bottom of the case and set it to the side. Be sure to note which holes the 3 longer screws go to - - for re-assembly.
2. Now unscrew the two (2) phillips screws holding the P.C. board to the case top.
3. Carefully lift the P.C. board a slight distance above the case. At this time, you'll be able to see the flexible P.C. connectors which connect between the membrane keyboard and the P.C. board. While holding the P.C. board in one hand, gently grasp the flexible P.C. fingers - ONE AT A TIME - THERE ARE TWO - and pull them out of their sockets. You have now disassembled the computer to the point where you can work on it or inspect it.
4. Before re-assembly, carefully check the plastic flexible P.C. fingers, preferably with a loupe. If any damage - breakage, tear, creasing, hair-line cracks - the damaged portion must be trimmed away. Also, on the smaller of the two (5 lines), I always cut a portion of the plastic for ease of re-assembly (See drawing). *Page 4*
5. For re-assembly, you must use either flat nose pliers or duck-bill pliers for the first stage. If you don't, you will almost invariably damage one or more of the delicate P.C. lines on the flexible fingers - as they did at the Timex factory in Portugal - and sooner or later you will find that four (4) or more of your keys have ceased to function.
6. Lay the case top upside down with bottom facing away from you. (I always rest the case on my knee - upside down - with the case bottom tilted against a table or desk). Now, holding the P.C. board with left hand, position the P.C. board and case top like a book partially open, say 30 to 40 degrees.
7. Take your flat-nose or duck-bill pliers and grasp the smaller of the two flexible P.C. fingers (has 5 lines). Carefully insert it into the special connector like so: Using a light touch, introduce the plastic into the socket so it is just touching the entrance. Now re-position the pliers so you are grasping the flexible plastic 1/16 to 1/8" (NO MORE) outward from the socket. Finally, while holding the plastic vertical to the socket, carefully push it into the socket. Re-position the pliers outward again 1/16 to 1/8" and push the plastic in until you hit bottom. Use minimum force and do not bend or crack the flexible plastic.
8. Repeat above process with the larger (8 lines) flexible plastic connections.
9. Using your #0 phillips screwdriver, re-install the 2 screws to hold the P.C. board to the case top.
10. Now replace the case bottom. Remember to insert the longer screws above and the 2 shorter screws below.
11. To replace the rubber feet, use Scotch double-sided tape. Failing that, use some form of adhesive or cement.

12/84

Jess Peeler

1284-10

The IC used in the Out Port circuit is a 74LS374. This circuit accepts data signals only when it is addressed to the clock input. The 'state' (high or low) is retained until the next clock pulse is sent to the 74LS374 IC. The IC will then be latched 'on'.

With the Out Port connected to the T/S 2068/Spectrum (it works with the Spectrum ROM) edge connector and 255 entered into location 64000, the following sequence would be carried out:

- 1- Basic Program: 10 OUT 31,PEEK 64000
- 2- 11111111 is the binary equivalent of 255 which appears on the data bus and the appropriate pins of the 74LS374 IC.
- 3- Signals $\overline{A5}$, \overline{WR} and \overline{IORQ} trigger gate 1 of the 74LS27 and direct it to latch all of the eight mono-stables (flip-flops) which outputs eight 1's to the eight output lines on the 74LS374.
- 4- The next basic command will remove the signals to the 74LS27 allowing the program to continue with other activities.
- 5- Since the 74LS374 is in a 'latched on' state, all eight outputs (eight 1's) will remain on until the next OUT 31 command is given. (OUT 31,0 will command the 'off' state.

Connect the Out PORT to the 2068 edge connector (With POWER OFF). Turn the computer on. If the copywrite appears on the monitor screen, then everything is OK.

With eight LEDs and eight 270 ohm resistors attached; one to each Out Port and ground, a simple program will activate all ports: OUT 31,255 or type: 10 FOR i=1 TO 255 , 20 OUT 31,(i) 30 PAUSE 10 , 40 NEXT i - This program will activate all eight ports and the LEDs will illuminate with the binary count (count 1 the first LED lights; count 2 the second LED lights; count three and the first and second LEDs illuminate ... and so on through count 255; all LEDs light).

MAPLIN ELECTRONIC SUPPLIES, LTD.; P.O. BOX 3, RAYLEIGH, ESSEX,
SS6 8LR ENGLAND

NOTE: The parts kit does not contain an edge connector.

1- 74LS374 and 1- 20 pin IC socket

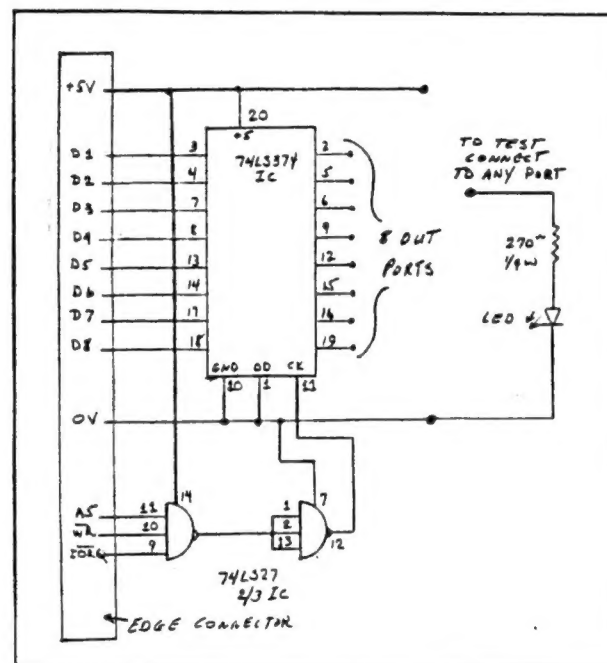
1- 74LS27 and 1- 14 pin IC socket

1- PC Board, Maplin, England or Perf Board, Radio Shack

1- Edge connector, Zebra Systems, Inc (Zebra also offers an experimenters board; can be used in place of perf board)

1- LED and 1- 270 ohm 1/4 watt resistor for testing output

.....Bob Gilder



LED TEST CIRCUIT

This project lets you install a 2764 Eprom into the existing 28 Pin Rom socket found on most TS 1000's. It involves minor modifications to make the 2764 pinouts compatible with the traces on the TS circuitboard. This project can also be done by trace cutting. However, the easiest way to make the modification is to install another 28 Pin socket, with the proper pins jumpered, into the Rom socket. With this method you can easily reverse your modification.

Pin 23 on the TS 1000 Rom is Address line A12. A look at the pinouts on the 2764 reveals that pin 23 is reserved for A11. This is our first jumper. The A12 line on the 2764 is on pin 2 and this is already thoughtfully provided for on your circuitboard: no modifications are necessary here. The only other change needed to complete the project is to bring ROMCS to pins 20 and 22 of the Eprom, and this will be our second jumper.

Only a few items are needed for the project: one 28 pin socket, some wire wrap wire and of course, a preprogrammed 2764. Bend socket leg numbers 20, 22 and 23 at a right angle to the socket body. Solder a jumper wire between 20 and 22. From here only two connections are needed to the TS 1000 circuitboard. Pin 23 will go to A11 and pin 20 to ROMCS.

You can pick up the ROMCS (trace 23B) line on the top side of the board by going to the 2nd pinthrough to the right of TR1. See Fig.1. This is the pinthrough closest to the edge of the board. A11 (trace 15B) can be picked up on the cathode end of D1. This is the first keyboard diode and the first diode to the right of R47 on the top side of the circuitboard (fig.2).

With this configuration it is a simple matter to revise your Rom routines to suit your needs. Examples that come to mind are 64K Ramtop check on powerup, revised character generator tables and revised printer port patches. We would be interested in hearing from those who are experimenting with modified Rom routines.

CEM BARUT

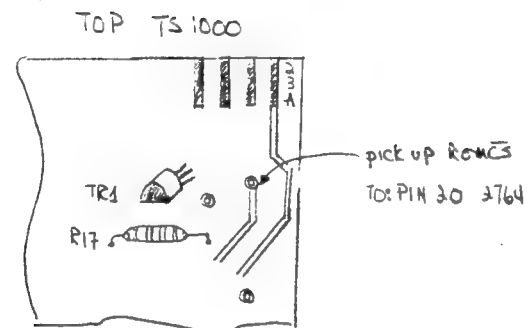
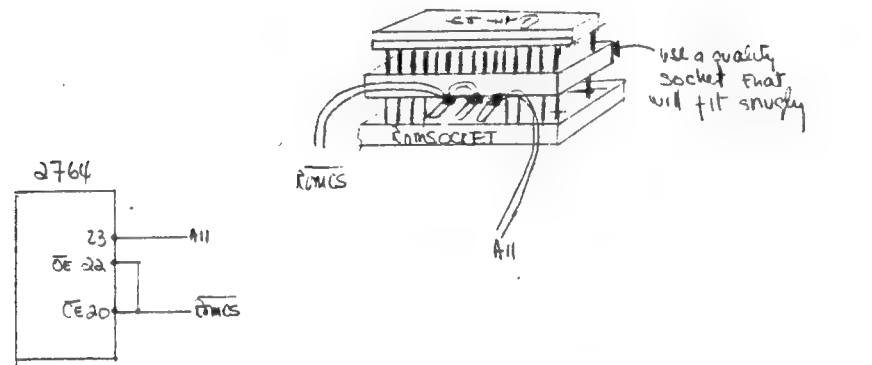


FIG 1

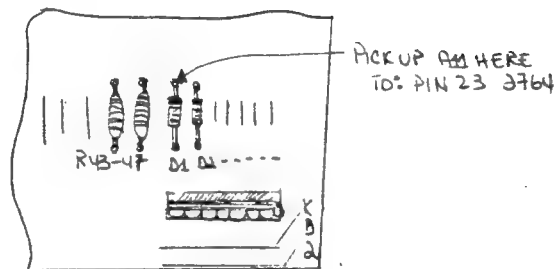


FIG 2

TOM BENT, 9016 Flicker Place, Columbia MD 21045, (301) 730-7187, has an upgrade for your ZX. Replace your 8K ROM with an improved eprom. Full display file, SCROLL/CLS works properly, LPRINTs small numbers (.0001), DIM very large single strings (DIM A\$(47000)) in 64K and a few other nice changes are incorporated. \$20.00 for EPROM and circuit. (It fits under the hood.)

Switchboard

From Computer Living/NY

Switchboard is a listing by area code of those area bulletin board systems that Computer Living/NY New York knows about. If your bulletin board number is not listed here and you want it to be, call our BBS, the Computer Living Connection, at (212) 548-6796, and post the information there for Marc Roth, BBS sysop. Or drop us a line at our Manhattan office, 155 E. 23rd St., New York, NY 10010.

NEW YORK (212)
 Paladin's Palace/open/pswd/-
 Medieval (212) 699-0861
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 Applesauce (212) 268-2062
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 CONNECT 80 NYC (212) 991-1664
 Earth News Central (Apple II +)
 (212) 934-0774
 TFC ABBS NYC (212) 799-9577

The Database BBS (212) 772-7167
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 490-1146
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 BBBS / Gen/Pswd/Prgm (212)
 775-1649
 AMIS/Gen/Pswd/Prgm (212)
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 536-3510
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 ABBS Pirates Cove (516) 698-4008
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 TBBS/Stock/Open (516) 794-1707
 The Dragon's Lair (516) 374-5071
 Phosphor (516) 671-6195

BEWARE!

These #'s change frequently

This is From LICA's BBS

Name	Telephone #	SYSOP	Specialty
FRBS	201 272-1874	Bruce Katoff	
T.A.B.	201 376-8055	Brett Shack	Adventures
FORUM-80	201 688-7117	Union, NJ	
ABBS ACGNJ	201 753-1225	Pompton Plains	
PHOTO-80	201 790-6795	Alan Hyman	Photography
ABBS CONJ	201 835-7228	Pompton Lakes	
CONNECT-80	201 842-7644	Lincroft, NJ	6-Mid M.W.Sun
ABBS Wyckoff	201 891-7441	Ralph Roehrich	
ABBS ACGNJ	201 968-1074	Dunellen NJ	
COMMUNIQUE-80	201 992-4847	Andy Frisch	
J--			
BROOMS	203 237-2668	Dave Schwartz	
BULLE1-80	203 744-4644	Joe Simon	
J--			
BAMS	212 362-1040	Roger Kaplan	
CONNECT-80/DNS	212 441-3755	Robert Rosen	Radio Shack
CONNECT-80/S.I.	212 442-3874	Staten Island NY	
IFLAKES N.Y.C.	212 799-9577	Adrian Steckel	
HARDWARE HAVEN	516 328-8209		
PHS OF LI W.	516 334-3134	Richard Tavior	
L.I.S.E. TRS-80	516 338-4083	Bill Rafferty	
MIDAS	516 367-8619	Marc Mandel	
M-BOARD	516 475-1005	Bill Wohlers	
INNOV-80	516 482-8491	R. Niederhoffer	
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LICA LIMBS CBBS	516 561-6590	Dave Minott	
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ENRAB ABBS	516 757-2227	R.K. Jiminez	On-line pgms
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THE MONASTERY	516 825-2753	Chris Caputo	
IBM-LNW BBS	516 924-8115	Jim Edwardson	
PORT PC RBBS	516 944-6712	Michael Krieger	IBM PC board
J--			
TELEPORT 64	914 623-4248	Michael Kleinert	
CONNECT-80/S.P.	914 942-2638	Stony Point NY	

And, of course theres the Zebra BBS - (718) 296-2229

Computer Shopper Bulletin Board

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 CONNECTION 80 Centerach, NY 516 588 5836
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LIST (LONG ISLAND SINCLAIR-TIMEX) GROUP, 10 IDLE
 DAY DRIVE, CENTERPORT, NY 11721
 LNW UG, RT 1 BOX 244, MILL RD., YAPHANK, NY 11980
 LONG ISLAND COMPUTER ASSOC., POB 71, HICKSVILLE,
 NY 11802

USERS GROUPS

✓ The Long Island Sinclair Timex Group formed when Timex/Sinclair left the personal computer arena. The group has been growing steadily ever since and wants to attract other Timex Sinclair owners.

For example, did you know that Timex 2068 owners can place the Sinclair Spectrum read-only memory in their machines to convert them to run hundreds of British software titles? Secretary-treasurer Paul Donnelly says he can supply these for less than \$20.

A monthly newsletter, meetings, and a small library of public domain programs are available to members. For more information, send a self-addressed, stamped envelope to the group at P.O. Box 438, Centerport, NY 11721.

LONG ISLAND

LIST (Long Island Sinclair-Timex) GROUP
 10 Idle Day Drive
 Centerport, N.Y. 11721
 For information send SASE
 LONG ISLAND COMPUTER
 ASSOCIATION
 P.O. Box 71
 Hicksville, N.Y. 11802

Computer Living/NY

COMMUNICATIONS CORNER

Bob M. offers the following tips which seems to be a de facto standard for up and downloading information to BBS's. Use:

(CONTROL R) to open your buffer
 (CONTROL T) to Close it.

WANTED: If interested in joining a users group for Timex/Sinclair computers on Long Island, drop me a post card, Heinz O. Henken, 9 Dartmoor Dr. East Northport, NY 11731.

July 1984

Byte

128
12

Dec. 10, 1984

Infoworld

A CROSS-CORRELATION OF THE SPECTRUM ROM VERSUS TS2068 Part 1

Copy Right © Aug. 1984 by N.A. Pashtoon

As most of us have noticed , machine code (MC) programs written for the Spectrum rarely work on the TS2068 . TIMEX Corp. in an attempt to upgrade the Spectrum's performance, included extra Basic commands , sound chip support , joystick support and more importantly bankswitching capability , which resulted in a redesign of the machine . As a consequence software enhancements and embellishments were put in the Read Only Memory (ROM) . Because of these enhancements the code would not fill the original 16K ROM . As such all the cassette handling routines and the bank switching code had to be relegated to the 8K Extension ROM (EXROM) .

To facilitate software conversion between the two computers , a disassembly of the ROMs of the two computers must be on hand . An excellent disassembly of the Spectrum ROM as well as a step-by-step explanation of every MC instruction is available in the superb book " The Complete Spectrum ROM Disassembly" by IAN Logan and Frank O'Hara . The book is available from both Melbourne House and Zebra Systems .

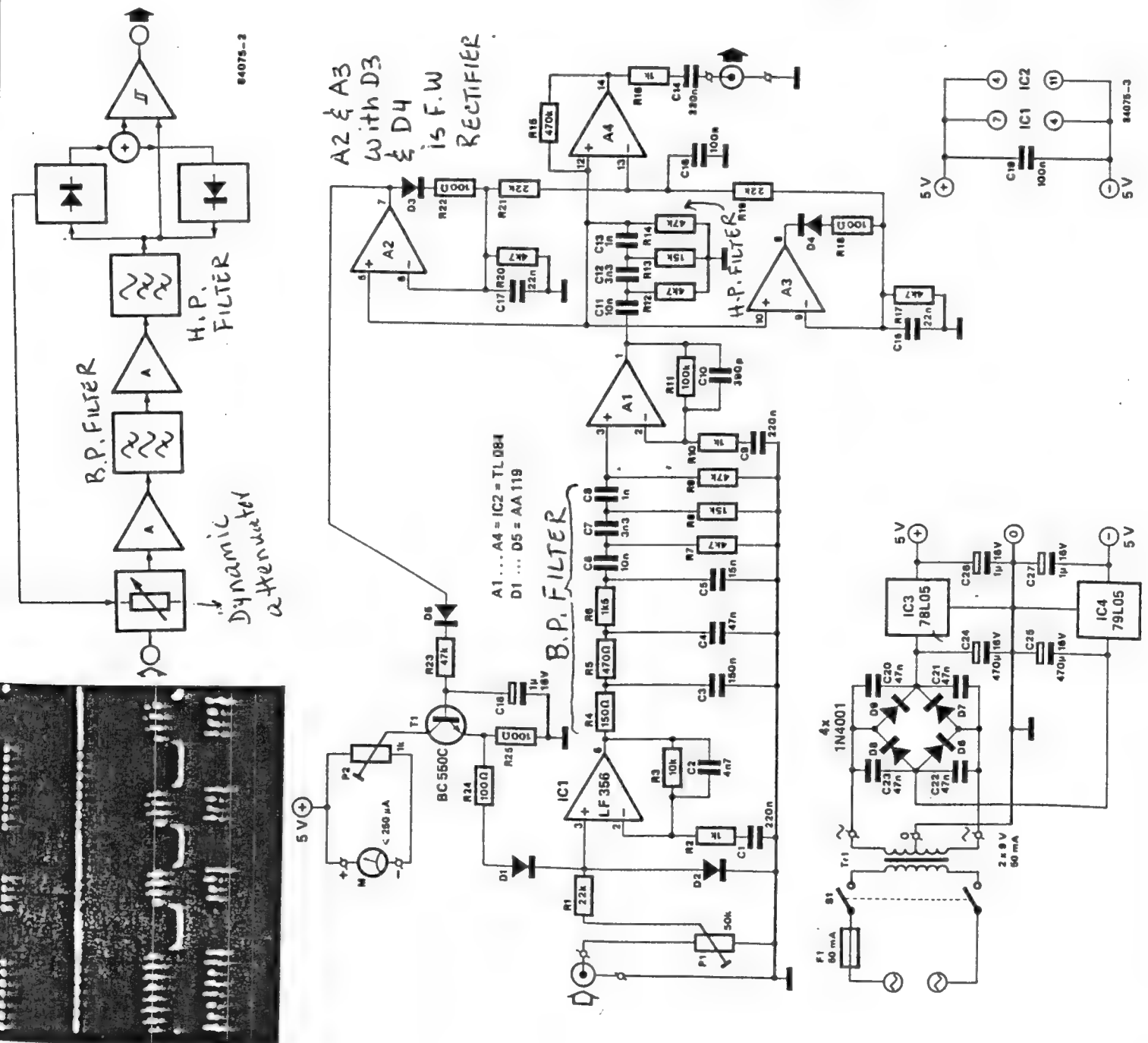
I worked on the TS2068 ROM-EXROM disassembly and prepared a ROM Atlas , establishing the cross correlation of the various ROM routines, in July 1984 . In August '84 I sent a copy to SYNTAX for publication , which was accepted for publication . As to what issue will it appear in I am not sure . Any way , starting with this issue of LIST we will start publishing the ROM Atlas serially . So hold on to your copies of LIST . The header reader in the Nov. '84 issue is part of this series of articles .

ROM ATLAS , COPY RIGHT N.A.PASHTOON

SPECTRUM			IS 2068			SPECTRUM			IS 2068		
LABEL, NAME	ROM Addr	PLUGIN	LABEL, NAME	ROM Addr	PLUGIN	LABEL, NAME	ROM Addr	PLUGIN	LABEL, NAME	ROM Addr	PLUGIN
START	0000 0000		CL-ATR	0E98		CL-ATR	0E98		09C3		
ERROR-1	0008 0008		CL-ADDR	0E9B		CL-ADDR	0E9B		09D6		
PRINT-A-1	0010 0010	WRCH	COPY	0EAC		COPY	0EAC		0A02		K-DUMP
GET-CHAR	0019 0018		COPY-BUFF	0ECD		COPY-BUFF	0ECD		0A23		DUMPPR
NEXT-CHAR	0020 0020		CLEAR-PRB	0EDF		CLEAR-PRB	0EDF		0A35		CLPR
FP-CALC	0028 0028		COPY-LINE	0EF4		COPY-LINE	0EF4		0A44		PRSCAN
BC-SPACES	0030 0030		EDITOR	0F2C		EDITOR	0F2C		0A82		EDIT-K
MASK-INT	0038 0030		ADD-CHAR	0F81		ADD-CHAR	0F81		0AE7		INSA
ERROR-2	004F 004F	PHLAF	ED-EDIT	0FA9		ED-EDIT	0FA9		0B12		
ERROR-3	0053 0053		ED-DOWN	0FF3		ED-DOWN	0FF3		0B59		
RESET	0055 0055	LE3	ED-LEFT	1007		ED-LEFT	1007		0B68		
NO-RESET	0066 0066		ED-RIGHT	100C		ED-RIGHT	100C		0B73		
CH-ADD+1	0074 0074	NEXTCH	ED-DELETE	1015		ED-DELETE	1015		0B78		DELSYM
TEMP-PT1	0077 0077	NC-HL	ED-ENTER	1024		ED-ENTER	1024		0B8A		
TEMP-PT2	0078 0078	TC-HL	ED-EDGE	1031		ED-EDGE	1031		0B97		
SKIP-OVER	007D 007D	TOKENS	ED-UP	1039		ED-UP	1039		0BBF		
TOKENS	0095 0098		ED-SYMBOL	1076		ED-SYMBOL	1076		0BDC		
KEYTBL	0227 0245		ED-ERROR	107F		ED-ERROR	107F		0BE9		
KEY-SCAN	028E 0280	K-SCAN	CLEAR-SP	1097		CLEAR-SP	1097		0BEF		DEL-K
KEYBOARD	02BF 02E1	UPD-K	KEY-INPUT	10A8		KEY-INPUT	10A8		0C0E		IN-K
K-REPEAT	0310 0336		ED-COPY	111D		ED-COPY	111D		0C83		ECHO
K-TEST	031E 033C		REMOVE-FP	11A7		REMOVE-FP	11A7		0D0D		DESLUG
K-DECODE	0333 0371		NEW	11B7		NEW	11B7		0D1D		K-NEW
BEEPER	03B5 03F3	PARP	START/NEW	11CB		START/NEW	11CB		0D31		INIT
PRINT-OUT	09F4 0500	SEND-TV	RAM-SET	1219		RAM-SET	1219		0D7F		NEW
PO-BACK-1	0A23 053A	P-LFT	MAIN-1	12A2		MAIN-1	12A2		0E28		LED18
PO-RIGHT	0A30 0534	P-RT	MAIN-4	12A9		MAIN-4	12A9		0E2F		LED4
PO-ENTER	0A4F 0566	P-NL	REPORT-MSG	1303		REPORT-MSG	1303		0F08		
PO-COMNA	0A5F 0576		MAIN-ADD	1391		MAIN-ADD	1391		0F65		
PO-QUEST	0A69 0580		CH-INFO	1550		CH-INFO	1550		1159		CHINIT
PO-TV-2	0A6D 0584		WAIT-KEY	15AF		WAIT-KEY	15AF		11A4		SHINIT
PO-ABLE	0A9B 0582	SET-AT	INPUT-AD	15C6		INPUT-AD	15C6		11C1		ROCH
PO-STORE	0AD9 05F0	STTVCU	OUT-CODE	15E6		OUT-CODE	15E6		11E1		INCH
PO-FETCH	0ADC 05F3	LDTVCU	PRINT-A-2	15F2		PRINT-A-2	15F2		11EA		PUTDTC
PO-ANY	0B03 061A		CHAN-OPEN	1601		CHAN-OPEN	1601		11ED		SENDOCH
PO-ALL	0B24 0638		REPORT-0	160E		REPORT-0	160E		123D		SELECT
PO-ATTR	0B7F 0684	ATTBYT	CHAN-FLAG	1615		CHAN-FLAG	1615		1248		ERRO
PO-MSG	0C0A 073F	PUTRES	CHAN-K	1634		CHAN-K	1634		129A		SEL-HL
PO-SAVE	0C3B 0776	PR-TV2	CHAN-3	1642		CHAN-3	1642		12A9		
PO-SEARCH	0C41 077C	TVFUL?	CHAN-P	1640		CHAN-P	1640		1283		
REPORT-5	0C55 0790	ERRS	ONE-SPACE	1652		ONE-SPACE	1652		1288		INSI
TEMPS	0C86 07C1	R-ATTS	MAKE-ROOM	1655		MAKE-ROOM	1655		12BB		INSERT
CLS	0D4D 0888	K-CLS	POINTERS	1664		POINTERS	1664		12CA		REMGZ
CLS-LOWER	0D6B 08A6	CLS	LINE-ZERO	169F		LINE-ZERO	169F		131E		
CLS-ALL	0DAF 08EA	CLS	RESERVE	169E		RESERVE	169E		1324		GET-LN
CL-SET	0DD9 0914	SCUR	SET-MIN	1680		SET-MIN	1680		1320		LCU2
CL-SC-ALL	0DDE 0939	CL-SET	SET-WORK	168F		SET-WORK	168F		133F		CLCL
CL-LINE	0E44 097F	CL-LINE	REC-EDIT	16D4		REC-EDIT	16D4		134E		X-CALC
			SET-STK	16C5		SET-STK	16C5		1363		X-I-HI
									1354		RESET

A ZX81 /TS1000/1500 PULSE CLEANER

In a recent issue of a general interest Dutch-based electronics magazine the following circuit was published . I think , I am reflecting the feelings of all ZX/TS users ,the dread with which we face the loading and saving problems with these machines . (One would think that Sinclair will learn from the experience of the Radio Shack TRS-80 Model 1 , but no ! they had to re-invent the wheel) . It is worth mentioning that the aforementioned Dutch magazine , in their past issues have addressed the problem of cassette loading for various makes of computers. Repeatedly , they have commented that these interfaces will not always work with some problematic tapes for the ZX81 . In other words , the designers for the magazine have been busy with this problem for a long time . The block diagram of the interface would hopefully explain the workings of the circuit . The circuit and then the power supply follows . Note that the one European transistor used can probably be replaced by a 2N2222 . The diodes D1,D2,D3,D4,D5 should be replaceable by 1N914 .



I really shouldn't review Supercode yet, as I haven't fully checked out all 100 of its routines. Many seem to be simple modifications of others (see attached screen dump), so I'll assume they work the same way as their cousins, which I have used.

Supercode toolkit is a compendium of 100 Machine Code routines, which you can integrate with your BASIC (or MC) programs to add speed, special effects or greater utility. There's even a header reader included. Each routine is well documented, within the program. You are told what the routine will do, how to call it up, how and where to SAVE it on your own tape, and even given a demo of the routine in action. Toolkits working parts take up about 8K as shown in Fig 1, and are all machine code.

Covering all 100 features in a review would be a bit tedious, so I'll just cover a few of the key routines:

- 1-17 - These are a series of screen scrolling techniques
 #1 Hi-Res Scroll UP, takes up 97 bytes, from 64001 on, #2 takes up 94 more and starts at 64096. Each of these will scroll the whole screen, but not attributes. #3-LORES SCROLL, is actually a ROM routine located at 3190 in ROM and it scrolls the attributes as well as ink and paper information. Further on, you can scroll any 1/3 or 2/3's of the screen. The more advanced user of these routines tell you how to achieve diagonal scrolling (all up and then right for example, repeatedly).

There are also ripple and shutter scrolling effects to give your program more pizzaz.

- 42000 Routine #42 is a program rememberer, it is only 38 bytes long and of course, doesn't do GOTO'S or GOSUB'S. 42's big brother #60, however, while eating up a hefty 681 bytes, does remember GOTO's and GOSUB's.
 65 Routine #65 disables the break key. I would POKE 60626, 201 to "disable the disable" while you are experimenting with the toolkit.

There follow then, some other interesting, assorted routines which will:

REM-kill- to save memory & speed up your program.

NON-deletable lines (actually just a couple of POKE 's from BASIC)

Variables list- to give all the variables in a program (#71)

Sound recorder- This is quite a neat little routine, through which you can actually record sounds into the memory of your Spectrum & play them back out to an external amplifier or tape recorder. You'll get about 5 seconds of speech (enough time to say "hello"-5 times) into your T/S this way. There is a drawback though, the encoding technique makes those 5 seconds of speech consume about 32K of memory. (#77)

Other routines will contract your program (i.e. make multiple statements where possible (#62)), read tape headers, block delete, convert hex to decimal, and so forth.

Supercode Toolkit is outstanding at \$5.95. There are a few disappointments, eg., CLEAR ALL routine tells you to RAND USR 0, Draw Stars- tells you to use the BASIC DRAW X,Z,N command: about ten in all. But, the other 90 routines, & especially those noted here, are each almost worth the price of the whole lot. ANOTHER 9 out of 10 for U.K. software!

S U P E R C O D E 2N SPECTRUM MACHINE CODE TOOLKIT F.VACHHA V.RUMSEY

INTRODUCTION

The Toolkit contains 100 machine code routines which you can call (using RANDOMIZE PRINT USR) both directly & from within your own programs. This BASIC program lets you list, test, customise, relocate SAVE & VERIFY routines easily - but the routines will work just as well if the program is absent. The code is from 57344 to 60461, it overwrites the first 12 UDGs. RAMTOP has been cleared to 57340. The Index follows- input the no. of a routine for its description (incl all addresses & POKEs) & an optional example. Get to know the Menu options (X:0/8-R:1/0/YN/D).

I N D E X

- 1 HIRES SCROLL-UP
- 2 HIRES SCROLL-DOWN
- 3 LORES SCROLL-UP
- 4 HIRES SCROLL-RIGHT
- 5 HIRES SCROLL-LEFT
- 6 LORES SCROLL-LEFT
- 7 LORES TOP 1/3 SCR-LEFT
- 8 LORES MID 1/3 SCR-LEFT
- 9 LORES LOW 1/3 SCR-LEFT
- 10 LORES TOP 2/3 SCR-LEFT
- 11 LORES LOW 2/3 SCR-LEFT
- 12 LORES SCROLL RIGHT
- 13 LORES TOP 1/3 SCR-RIGHT
- 14 LORES MID 1/3 SCR-RIGHT
- 15 LORES LOW 1/3 SCR-RIGHT
- 16 LORES TOP 2/3 SCR-RIGHT
- 17 LORES LOW 2/3 SCR-RIGHT
- 18 RIPPLE-SCROLL LEFT
- 19 SHUTTER-SCROLL LEFT
- 20 RIPPLE-SCROLL RIGHT

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25A to Vernon Valley Road, go south to Friendly's (pass the Post Office)
Go left on Alerton and then 1 block to a "T" intersection
Go left on Carrington and follow it to Dartmoor - 9 Dartmoor is shake shingled ranch,
just past the fire hydrant on the left.

SUNDAY JAN 6th 1984 - 2PM.

"MEMBERS ONLY" PAGE.

LIBRARY TAPE #17 contains the following programs.

Program: circle
Program: FILER
Program: colorbar
Program: breathers
Program: BAR CHART
Program: MOIRE
Program: word
Program: cirfil
Program: potcha
Program: PRO TECH
Program: HEADER-T
Program: HEADER-3
Program: CHARSET
Program: ALTCHAR 1
Program: ALTCHARSET
Program: TRACE
Program: DISASMBLR
Program: ASSEMBLER
Program: ASSEMBLER
Program: MCON
Program: DISASMON
Program: MCUTIL
Program: renum
Program: RESVAL
Program: TOMORROW

Program: moonlander
Program: disaster
Program: moonrescue
Program: galactoids
bytes: galactoids
Program: tower
Program: Apple
Program: Piano
Program: sf10
Program: missile
Program: pusgun
Program: t
Program: bj
bytes: bj
bytes: bj
Program: BLACK MASK
Program: CHECKERS

Program: firstloadr
Program: firstloadr
Program: firstloadr
Program: firstloadr
Program: MEMOR
Program: udg-demo
bytes: udg
Program: expnd
Program: circle
Program: FILER

TS2068 Programming Tip

Faster Control

If you have a long text to edit
and you feel like your computer
is worn out before it starts, -OR
if your laser guns aren't firing
fast enough for you, --Try these
commands BUT BE-ARE!!!

POKE 23561,0 (0 = 1 TO 35)
(I prefer 10 to 15 for Text)

POKE 23562,0 (0 = 1 to 5)
(I prefer 3 for Text)

For the touch typist this is
really a terrific advantage.

POKE 23561,0 (0 = 1 to 35)
(I prefer 1 to 10 for Games)

POKE 23562,0 (0 = 1 to 5)
(I prefer 1 for Games)



Timex Sinclair 1000 w/16K RAM Pack & Timex Sinclair 1500 New Year's Eve

```

10 DIM B(8)
20 DIM L(28)
30 FAST
40 FOR X=1 TO 8
50 LET B(X)=2*(X-1)
60 NEXT X
70 LET FL=0
80 LET P1=1
90 LET P2=2
100 LET DS="0,0,129,255,1,0,0,0,224,100,161,255,1,0,0,
0,239,145,145,239,0,0,0,220,145,145,142,0,"
110 FOR X=1 TO 28
120 GOSUB 1000
130 LET L(X)=VAL NS
140 NEXT X
150 SLOW
160 CLS
170 PRINT "TO SET THE COMPUTER CLOCK,"
180 PRINT "PLEASE INPUT THE TIME IN HOURS,"
190 PRINT "MINUTES, AND SECONDS"
200 PRINT "(E.G., 0955.00); THEN"
210 PRINT "PRESS <ENTER>."
220 PRINT
230 PRINT "WHAT TIME IS IT NOW?"
240 INPUT TS
250 IF LEN TS<6 THEN GOTO 160
260 LET TS=0
270 FOR X=1 TO 6
280 IF CODE TS(X)>27 AND CODE TS(X)<38 THEN GOTO 300
290 LET TS=X
300 NEXT X
310 IF TS=1 THEN GOTO 160
320 LET HRS=VAL TS(1 TO 2)
330 LET MIN=VAL TS(3 TO 4)
340 LET SEC=VAL TS(5 TO 6)
350 IF HRS<0 OR HRS>12 OR MIN<0 OR MIN>59 OR SEC<0 OR
SEC>59 THEN GOTO 160
360 LET TIM=HRS*3600+MIN*60+SEC
370 CLS
380 PAUSE 25
390 IF TIM=43195 AND TIM=43200 THEN GOTO 510
400 LET TIM=TIM+1
410 IF TIM=43200 THEN LET TIM=3600
420 IF TIM/5<>INT(TIM/5) THEN GOTO 380
430 LET HRS=INT(TIM/3600)
440 LET MIN=INT((TIM-HRS*3600)/60)
450 LET SEC=TIM-HRS*3600-MIN*60
460 LET TS="00:00"
470 LET TS(2+(MIN<10) TO 3)=STRS MIN
480 LET TS(5+(SEC<10) TO 6)=STRS SEC
490 PRINT AT 10,10;HRS;TS;" "
500 GOTO 380
510 CLS
520 FAST
530 LET CH=INT(RND*12)+128
540 FOR M=1 TO 28
550 LET L=L+(M)
560 IF L=0 THEN GOTO 630
570 FOR B=0 TO 1 STEP -1
580 IF L<B(0) THEN GOTO 620
590 LET L=L-B(0)
600 PRINT AT 2*(B=0)+1,M;CHRS CH
610 NEXT B
620 NEXT M
630 SLOW
640 PAUSE 125
650 LET FL=NOT FL
670 GOTO 530
1000 IF D8(P2)="," THEN GOTO 1030
1010 LET P2=P2+1
1020 GOTO 1000
1030 LET NS=D8(P1 TO P2-1)
1040 LET P2=P2+2
1050 LET P1=P2-1
1060 RETURN

```

FAMILY COMPUTING

In the June issue of *SOFTLY* we made an error when giving the POKE for infinite lives for the Software Projects version of *Warrior Miner*. It should have read: POKE 35135,0 Sorry!

Now a few hints for your own programs.

To reset the computer on an error report or BREAK:

```

10 POKE 23613.9: POKE 23614.91
To take the computer reset if INKEY$=BREAK
10 POKE 23613.9: POKE 23614.91: POKE
23299.0: POKE 23299.0
20 PRINT " "
30 GOTO 20

```

PATCH KIT #1

Patches for the TS1000/ZX81 Zebra Joystick Adaptor.

Please feel free to share these patches with your friends. They were contributed by customers like yourself. Special thanks are due to Mr. Don O'Neill for his cracking of the very complicated Times Flight Simulator program. It is by far the most asked for patch.

Although we believe these patches to be correct we cannot guarantee them. We have no control of possible different versions of programs being issued. The majority of these programs auto-RAM, so you will need some form of LOAD AND BREAK program to install your patches.

PATCHKIT#1

18501 219
18604 29
18605 0
18606 0
18615 203
18616 87
18625 203
18626 95
18635 203
18636 71
18645 203
18646 79
TYPE 7010 & 7020
TO ERASE THEM

ZEBRA SYSTEMS INC. 75-01 Jamaica Ave Whitestown, NY 14621

NOTHENSCHIP

18450 219
18451 29
18452 0
18453 0
18459 103
18472 87
18483 95
18494 71
18510 71
18534 79

GOBBLEMAN

17560 219
17561 29
17562 47
17574 4
17575 2
17576 1
17577 8

SCRAMBLE

17407 219
17408 29
17409 47
17410 254
17411 16
17412 32
17413 2
17414 203
17415 239
17416 33
17417 170
17418 67
17419 119
17420 237
17421 111
17422 203
17423 6
17424 237
17425 103
17426 24
17427 21

FOR INTERRUPT:

18463 219
18464 29
18465 254
18466 62
18467 202
18468 94
18469 72
18526 241
18527 241
18528 201
PRESS BUTTON &
HIT BREAK KEY

RAIDERS

17721 29
17725 95
17714 87
17724 29
17726 103

MAZES

19281 219
19281 29
19284 47
19290 1
19300 51
19302 8
19306 2
19308 50
19309 24
19310 10
19322 16
19327 17
19328 48

USE BUTTON TO VIEW,
BUTTON AND DIRECTION
TO GET SITUATION

TWO "DRAW" & "PLOT" PROGRAMS BY GUY QUALLS

Here are two fine programs for the 2068 using several of the new commands. In our next issue we will present Guy's *PHONEBOOK* program. Guy's address is: Guy Qualls, 4201 Dimmitt Rd. #38, Plainview, TX 79072.

```

10 PRINT "Draw joystick needed
-----"
USE 0
15 CLS
20 LET a=100: LET b=75
30 PLOT a,b: INK 0
37 IF STICK (1,1)=5 THEN LET b
=b+1: LET a=a-1
40 IF STICK (1,1)=1 THEN LET b
=b+1
45 IF a<0 THEN LET a=0
47 IF STICK (1,1)=6 THEN LET a
=a-1: LET b=b-1
50 IF STICK (1,1)=4 THEN LET a
=a-1
55 IF a>255 THEN LET a=255
57 IF STICK (1,1)=10 THEN LET
b=b-1: LET a=a+1
60 IF STICK (1,1)=2 THEN LET b
=b-1
65 IF b<0 THEN LET b=0
67 IF STICK (1,1)=9 THEN LET a
=a+1: LET b=b+1
70 IF STICK (1,1)=8 THEN LET a
=a+1
75 IF b>175 THEN LET b=175
1000 GO TO 30
9999 SAVE "draw" LINE 10

```

```

10 PRINT "DRAW2 THIS DOES NOT
CHECK FOR
Y KEY TO START": PAUSE 0
12 CLS
15 PRINT "Where do you want to
start line at?"
25 INPUT q: INPUT w
26 CLS
27 PLOT q,w
30 IF STICK (1,1)=5 THEN DRAW
-1,1
40 IF STICK (1,1)=1 THEN DRAW
0,1
47 IF STICK (1,1)=6 THEN DRAW
-1,-1
50 IF STICK (1,1)=4 THEN DRAW
-1,0
57 IF STICK (1,1)=10 THEN DRAW
1,-1
60 IF STICK (1,1)=2 THEN DRAW
0,-1
67 IF STICK (1,1)=9 THEN DRAW
1,1
70 IF STICK (1,1)=8 THEN DRAW
1,0
1000 GO TO 30
9999 SAVE "draw2" LINE 10

```

3D MONSTER HUNT

18277 219
18228 29
18229 47
18244 1
18252 4
18268 8
GOTO 1010 TO SAVE
PRESS A KEY TO START

FLIGHT SIMULATOR

TYPE 3 REM
FOLLOWED BY 41 X's.
POKE AS FOLLOWS:
17317 253
17318 75
18453 205
18454 187
18455 2
18456 219
18457 29
18458 203
18459 71
18460 32
18461 3
18462 33
18463 239
18464 239
18465 203
18466 79
18467 32
18468 3
18469 33
18470 239
18471 223
18472 303
18473 87
18474 32
18475 3
18476 33
18477 247
18478 223
18479 203
18480 95
18481 32
18482 3
18483 33
18484 239
18485 247
18486 203
18487 103
18488 32
18489 3
18490 33
18491 254
18492 223
18493 201
PRESS BUTTON FOR
VISUAL LANDING
VIEW

From Triangle users Group Newsletter

TYPICAL WINKY BOARD



MEETING DATE CHANGED

Last minute problems have forced us to change the January meeting date to January 6, 1984, still at 9 Dartmoor, Northport - 2:00PM.

18
12/84

THE TS2068 EQUIPPED WITH MICRODRIVES & EMU-1

N. A. PASHTOON

A note on Copy Rights: This article, as you may have noticed, does not bear a Copy Right notice. We believe that the wider dissemination of this type of information is in general public interest of TS users, in hopefully generating wider support for the TS2068 computers. As such, any TSUGs wishing to reprint this article, may do so, provided that due credit is given to LIST and the author.

Acknowledgements : I would like to thank Mr. Doug Dewey of the Triangle Users Group for supplying me (Sept. '84) with priceless information on TS2068 computer as well as the microdrives. Thanks are also due Mr. Roy Perschy, for an informative half hour exchange of ideas in mid October. That was the time, when both of us had zapped our Interface 1 and microdrive units in experimentation. Breaking the connection between the BE pin and ROMCS was his idea. Last but not least, thanks to our editor, Paul Donnelly, for cheerfully taking my calls at odd hours, and for his engaging technical discussions and ideas.

WARNING : The interfacing project described in the following paragraphs is an advanced project, in the sense that the connection of so many wires becomes very tedious and confusing. To safeguard the health of your computer, as well as your investment in the Spectrum Interface 1 unit and the microdrives, perform multiple checks before any physical connections are attempted to live buses. Especially be careful with the power connections. LIST and the author assume no responsibility or liability for any damage caused by your experimentation.

The Sinclair Spectrum computer, provides low cost, reliable mass storage on small continuous loop magnetic tape cartridges. The cartridges are theoretically capable of storing up to 125 kB of data (comparable to the storage capacity of the Commodore 64 disks). In practice, though, a sample of ten cartridges showed that the average storage capacity is more like 90 kB. The SAVING and LOADING of programs on the cartridge is achieved by a small cartridge drive mechanism with a read-write head and associated electronics, which Sinclair calls the microdrive. The microdrive and the Spectrum connect to each other via a black flat-lying box which Sinclair calls the Interface 1. The Interface 1 connects directly to the male edge connector on the back of the Spectrum, with the Spectrum resting on the forward sloping surface of the Interface 1.

Timex Corp., in their infinite corporate wisdom, decided to redesign the Spectrum, and make it into TS2068, also redefined the physical location of the various signals on the TS2068 edge connector. Both computers do have substantially similar signals on their buses, but there exist some differences too. As such, one cannot connect the Interface 1—microdrive combination directly to the TS2068 bus. In other words, an interface board between the TS2068 and the Interface 1 unit is required. Such an interface (henceforth called the TWISTOR) serves the purpose of alleviating the incompatibility problem that exist between the two buses.

The re-wiring scheme on the Twistor is illustrated in Fig.1. Fig.1 shows the 56 pin Spectrum bus with all the signals and power pins as it appears on the female edge connector on the Interface 1 unit. Any and all pins on this bus which requires a connection to the TS2068 bus is also shown in the diagram. The suffix T and B with any pin number refers to Top (component side) and Bottom (solder side); respectively, of a board. As an example, in Fig. 1, pin 27T which is A₁₀ on the Spectrum bus, should be wired on the Twistor, to A₁₀ of the TS2068 bus which is pin 19B. Any pins on the Spectrum bus, which do not have a parenthetical number indicated in the diagram should not be connected to any pin, for the purposes of this project.

The diagram in Fig.1 is sufficient for the construction of the Twistor except for the power connections. In order to reduce any confusion in wiring, and to facilitate double checking of the wiring, Fig.2 shows the TS2068 bus, pin numbers, signals, and power specs. For any pin which needs a connection to a corresponding point on the Spectrum bus, the connection is indicated parenthetically per the convention described before.

Now to power connections. In Fig.1, pins 22T, 23T and pin 4B, on the Spectrum bus, are shown as connected to a regulated supply. On my Twistorboard, I derived the appropriate power from the TS2068 bus pin 3B (Fig.2), through the use of a regulator. The voltage on pin 3B is nominally specified by Timex as +15 v, and is the raw DC from the power pack of the computer. The choice of the regulator was dictated by the available device in my junk box, namely a 12 v. 1.5 A rated LM340K-12. The circuit for this regulator and the connection pins on the Twistor are illustrated in Fig. 3.

Other parts needed for the Twistor is a perforated circuit board (Radio Shack 276-147 or the slightly smaller board); a 64 pin female edge connector (wire wrap type), a 56 pin male edge connector, and wire wrapping headers. The edge connectors you will use must have a spacing of 0.1 inches between the pins. It is important to note that the Interface 1 when it lies flat on a horizontal surface, has a forward sloping angle of approximately 15 degrees. This of course causes the female bus connector on the Interface 1 to have a similar angle with respect to the horizontal. The implication is that a rigid perforated circuit board with edge connectors on both ends could be problematic, to say the least, and at worst the stress on the computer board could damage the computer. I solved the problem by soldering an AP Products right angle strip header (#923878-R) on the perforated board, with a male edge connector soldered in between the pins, and satisfying the 15 degrees requirement. I also used AP Products straight wire wrap headers on the board to facilitate wire wrapping. It helps the wiring and double checking process tremendously to color code data bus, address bus, control bus, and the power distribution wires.

As mentioned in the beginning I zapped one Interface 1, not because of wiring errors, but because of careless measurements on 0.1 inch spacing wire wrap pins with my Sinclair DVM, while watching the display the probe slipped and shorted high voltage to a bus signal wire. I had to wait till Dec.6 to take delivery of a new Interface 1 and a 48K Spectrum. The moral of the story is to be extremely careful, especially with the power distribution wires. My suggestion is that you complete all the wiring first, except for power, triple check (or better yet, let some friend do the tracing), and then test the board with the TS2068, i.e. without the Interface 1 unit connected to the Twistor. Momentarily turn on the computer, and make sure that the copy right notice comes on the screen. Otherwise, turn off your computer immediately, and check your wiring till you find the source of the problem. After the Twistor passes the above test, complete the power connections on the board. Now insert your EMU-1 in the TS2068 cartridge slot, connect the Twistor and the Interface 1 and the microdrive to your computer. Start Praying (kidding). Turn on your computer. If everything is alright you will see the usual sequence of the copy right notices. Now insert a cartridge in the microdrive slot and type in RUN. You should get an error message MICRODRIVE NOT PRESENT... if you have inserted a blank cartridge. But if you have inserted, say, the sample programs cartridge, supplied with the drive, you will hear the pleasant and welcome purring of your microdrive. Sit there and be amazed and enjoy the speed of the device.

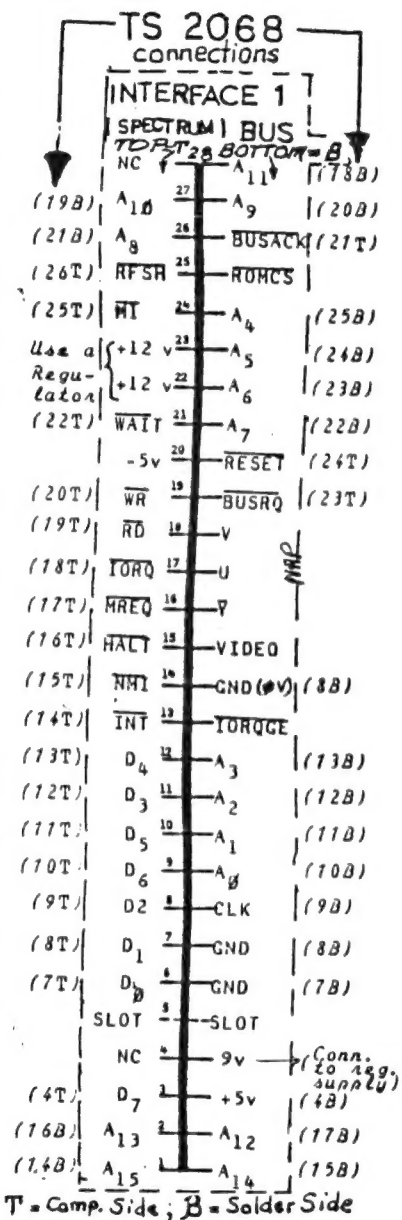


FIGURE 1

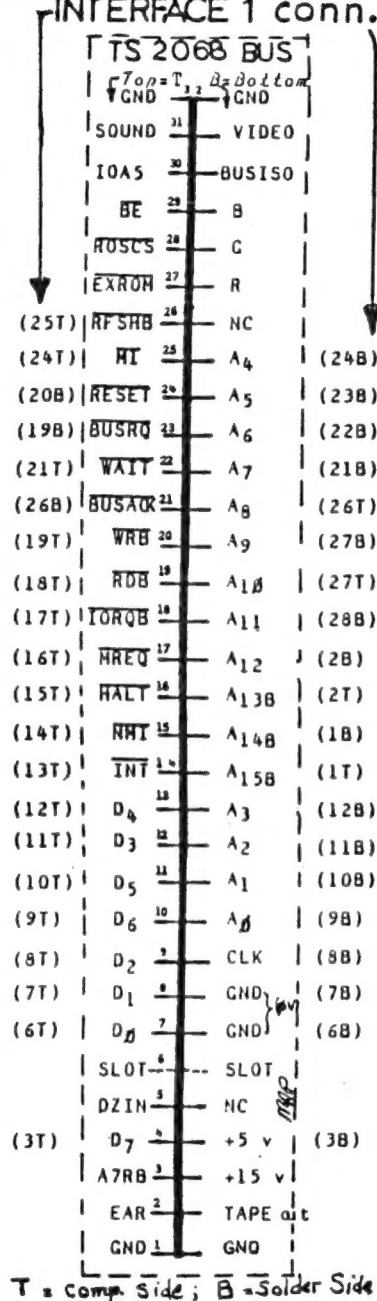


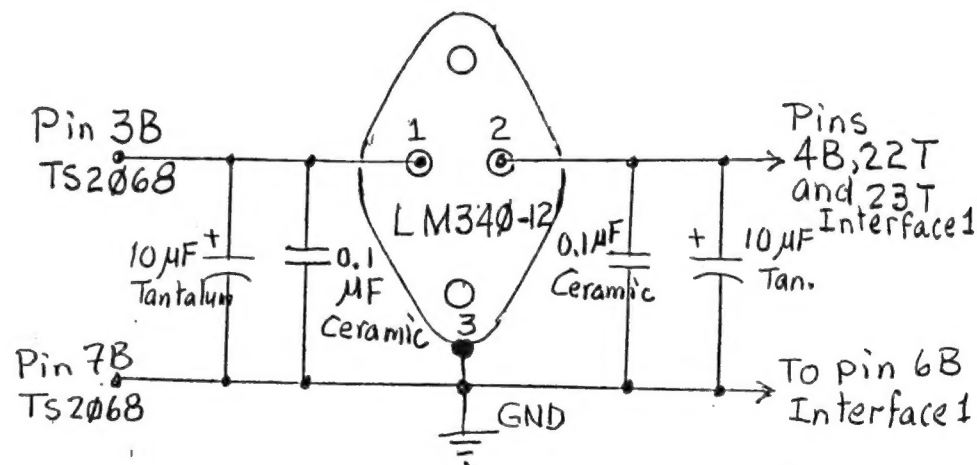
FIGURE 2

A note is in order for the above mentioned test procedure. If during testing, or any other time, you get error messages like the above, with incorrect spelling and missing letters, turn off your system. The cause is improper connection on the edge connectors. Juggle both connectors side ways (gently please!) so appropriate contact is established.

Finally, if I were building the Twistor now, I will opt for using the Zebra Systems edge connectors and TS2068 prototyping board. I would cut the Zebra board so that it is just the width of the Interface 1 unit, with a male edge connector attaching it to the Interface 1 unit. I will use a cable between the Twistor and the TS2068. This way all the critical angling problems, and poor contact between edge connectors and buses will be solved. On the other hand if you wait a few weeks ("Real Soon Now": as Jerry Pouchelle of Byte Magazine will say), there is a possibility of the announcement of a finished PC board. Keep checking your favorite BBs. (Please don't write to LIST or me, since we will not be involved in the venture).

As of the time of this writing, I am starting to test the RS232 port on the Interface 1. After I receive my first damaged Interface 1 from England, I plan to test the networking capability of the system. Any interesting developments will be reported in LIST.

Fig. 3



HARDWARE NOTES:

A question as to whether the regulator is at all necessary is in order. If one opens a μ -drive (forgive me Sinclair!) one discovers a ULA, two transistors and a 78M05 regulator. The μ -drive bus reveals that raw DC is sufficient to operate the drive. The problem encountered when using the Interface 1 with the Timex computers, is that the power pack for the TS2068 delivers too high a voltage. The electrolytic capacitors in the μ -drive are rated at 16 v. The smoothing capacitor in the Spectrum power pack is also rated at 16 v. The service manual for the Spectrum specifies the absolute maximum peak of the ripple (no load, line voltage at 265 vAC) at 15 volts, and the minimum trough of the ripple (full load, line voltage 210 vAC) as 7.5 v. This means that the raw DC which for TS under no load conditions is nominally 22 v., is too much. Therefore the DC voltage level has to be lowered. What better solution than using a regulator IC? From the above it is clear that, for example, a 9 v. 1A will also do the job. The 1A rating will cater to your future expansions also. The +12 and -5 volts on the Spectrum are obviously required to accommodate the RS232 interface. But the RS232 interface is not so fussy (the voltages should have been ± 12 v. to start with) about voltage levels, then +9 and -5 v. is sufficient, where the -5 volts can be generated using either the Mostek DC-5 module, or the ICL7660, or a diode pump. In practice, the RS232 interface will even respond to ± 3 volts. The requirements for the networking option of Interface 1 are still unknown.

SOFTWARE NOTES

In order to get a disassembly of the Interface 1 8K ROM, you can copy the ROM into the system RAM. Type and RUN the following program:

```
10 CLEAR 32767
20 SAVE "m";1;"INT1 ROM"CODE 0,8192
30 LOAD "m";1;"INT1 ROM"CODE 32768
40 SAVE "INT1 ROM"CODE 32768,8192
```

The program copies the 8K ROM onto a μ -drive cartridge first, then loads the code in RAM starting at address 8000H, and finally SAVES a copy to cassette tape. If you have a Spectrum disassembler you don't need line 40. LOAD the disassembler. On the other hand use line 40 to get a copy on tape. Now using the TS2068 alone, use any of your favorite TS2068 disassembler. I have a disassembly, using the HOT Z-AROS cartridge (Oh! how very much I like this version of HOT Z).

The disassembly reveals that ports EF and F7 are used for control and status and other communications between the computer and the μ -drive. With the EMU-1 in the cartridge slot, for example, execution of the Basic line OUT 239,0 will turn on the μ -drive light, and the motor in the drive will start running. Surprisingly, when EMU-1 is not in the slot, the execution of the same line either from Basic or HOT Z will cause the TS2068 to freeze. (Does this mean that Russel's ROM Switch may not work?!). This is definitely an interesting problem to look into.

The one disappointment, while studying the 8K ROM disassembly, was that the whole 8K ROM is full of code, except for 33 bytes which are not programmed. If some one out there in TS-land attempts to modify the 8K ROM code so that Interface 1 works directly with the TS2068 (without EMU-1 or ROM Switch) he/she will be facing a great challenge. The only person whom I can think of who very likely can manage it is Ray Kingsley (of HOT Z fame, and recently of the EXROM Corrector fame): RAY, HOW ABOUT IT?! How about the reprogrammed EPROM being installed on an Oliger board in the cartridge slot? Obviously, the user will have to remove the existing 8K ROM from the Interface 1.

The interface 1 when connected to the system, causes the extension of the system's variables by 58 more bytes, defining new variables for use of the μ -drives, RS232, and networking. Of course, this will be in conflict with the TS2068 extension of the system variables area. The reprogramming job will be extensive. The channels and streams map's also extended.

The principle behind the operation of the Interface 1 unit is achieved by paging-in the 8K ROM. The Interface 1 8K rom overlays the lower 8K ROM of the system 16K ROM. The paging-in occurs whenever the Z80 PC counter has a value of 8, i.e. when a RST08 happens. In the normal TS2068 and Spectrum environment RST08 is followed by a byte which determines what kind of error message the computer will print. With Interface 1 connected, whenever a RST08 is encountered it pages-in the 8K ROM in the interface. The ROM checks whether the error is the normal type of error, if so, the 16K ROM is switched back on and normal processing proceeds. But if the error was caused, say, through the use of any of the new μ -drive commands (syntax failure), the 8K ROM then processes that command, and then it switches itself off, enabling the 16K ROM.

SOME INTERFACE 1 ADDRESSES AND HOOK CODES

Address	Name	Code	Function
0881	232IN	1D	The input from RS232 in A.CY=valid
0C51	232OUT	1E	Output to RS232.Chay. code in A.
0DB2	WRITE_N	30	Write network packet.
0EA9	OPEN_N	2D	Open temp. "N" channel.
10C4	RECLAIM	2C	Reclaim the 595 bytes of "M" area.
11FF	WRITE_S	26	Send the "M" buffer to the drive.
12A9	CLOSE_M	23	Close the "M" channel.
17F7	MOTOR	21	For turning the motor on or off.
19A4	SHADOW	32	Call the Interface 1 ROM routine pointed to by the new system variable HD 11 i.e.(5CED).
19A8	NEWVARS	31	Generate the new Vars. if needed.
19D9	PAUSE	1B	Wait for a keypress.Value inA.
19EC	PRINT	1C	Print CHR\$ A to screen (stream FE)
19FC	LPRINT	1F	Print to printer (stream 3)
1A01	SCAN_K	20	Keyboard scan . NZ if pressed.
1A17	READ_P	27	Aprint buffer is read.
1A24	CLOSE_N	2E	Close an "N" channel.
1A4B	READ_R	28	Random file search.
1A7B	READ_S	29	Serial file search.
1A86	WRITE_R	2A	For writing a block randomly.
1A91	ERASE	24	For erasing files from the cart.
1D6E			

AFTERTHOUGHTS

- 1) Does any one out there in TS-Land remember a TIMEX technical memo #0003, dated 11/02/83. In that memo Timex referred to routines for Centronics Interface with both TS mode and CP/M mode. The invocation of these routines was through a service code which was supposed to be put after a RST 08. The amount of time that I wasted on that, and kept crashing the system left and right. It seems the concept is similar to the hook code concept for the microdrives. The service codes in that memo were utilized for the Function Dispatcher *Laker*.
 - 2) Now being on the subject of the Function Dispatcher, every body will agree with me, that it is the most useless code. As Kingsley points out in the HOT 2-AROS documentation, if you know the entry point address to a routine why take the circuitous route and time consuming method of the Function Dispatcher? So why not get rid of the code for it in RAM, and opening the space for the new variables and channels which needs to be created for the microdrives?
- Finally, Happy New Year to the inhabitants of the TS-Land. Happy μ -driving in 1985. NAP Dec.15,'84.

The access to the routines in the Interface1 8K ROM is provided by the byte following the RST08. This byte is known as a "hook byte". Hook bytes, ranging in value from 1BH to 32H provides such access. The hook byte 32H which Sinclair classifies as RESERVED, is interesting, because it enables one to get access to many 8K ROM routines, as well as achieve the paging of the 8K ROM.

Most of the routines in the 8K ROM uses all the main registers of the Z80 as well as HT, and IX. Thus these registers should be stacked for a safe entry and return.

Finally the manual provided with the Interface 1 is very good as far as the needs of the Basic programmers are concerned. Judging by the review of various books in the market, and having in my possession a book by Ian Sinclair and another by Andrew pennell, I have to say that Pennell's book is an excellent reference work. It caters to the needs of both MC and Basic programmers. It has some nice MC routines, a good chapter on RS232, and a chapter on networking. The title and other info about the book follows:

Pennell, Andrew: "Master Your ZX Microdrive", Sunshine Books (an imprint of Scot Press Ltd.), London, England, 1983.

NOTE: Any feedback on the Interface 1 unit, RS232 interfacing, and networking from other TSUGs will be greatly appreciated. Please address your correspondence to the LIST P.O. Box.

The information that is supplied in the following paragraphs was compiled from "Your Computer" magazine, Pennell's book, The Microdrive Manual and some other documents.

THE RST XX IN THE INTERFACE 1 ROM

When you page in the Interface 1 ROM, the meaning of the Z80 restarts is different. You can't use the hook codes any more, but then you can call the subroutines directly. Also note, that even though the interrupts are on, the keyboard is not scanned and neither is FRAMES incremented. The restarts are as follows:

RST 0: Resets FLAG3 and returns you to the system ROM. (Unless I am mistaken, the TS2068 equipped with EMU-1 and the microdrives freezes when this restart is done!)

RST 8: Do not use this one.

RST 10: The two bytes following this RST are treated as the address of the system 16K ROM routine, so those routines can be called.

RST 19: Used for Syntax checking.

RST 20: The 8K ROM error check. The byte following it determines the type.